CLAIMS

The following is claimed:

1. A method for providing adaptive rate selection in a discrete multi-tone system, comprising the steps of:

specifying a data transmission delay rate for a channel utilized for data transmission;

specifying a number of redundant bytes in a Reed Solomon frame;

determining a level of impulse protection control from said number of redundant bytes in said Reed Solomon frame and a user selected maximum code word length;

determining a number of symbols comprised within said Reed Solomon frame; and

determining an interlever depth via use of said number of symbols comprised within said Reed Solomon frame and said specified data transmission delay rate for said channel.

2. The method of claim 1, further comprising the step of, determining a maximum and minimum number of symbols in said Reed Solomon frame, wherein said number of symbols contained in said Reed Solomon frame is between said maximum and minimum number.

3. The method of claim 2, wherein said maximum number of symbols in said Reed Solomon frame is the lower of the number 16 and, the data transmission delay divided by four.

4. The method of claim 2, wherein said minimum number of symbols in said Reed Solomon frame is the higher of ½, and said data transmission delay multiplied by the quotient of four divided by a maximum interleaver depth.

5. The method of claim 1, further comprising the step of determining capacity of said channel utilized for data transmission, wherein said data rate determination is performed via use of said determined capacity of said channel.

6. The method of claim 1, further comprising the step of determining a data rate of transmission via use of said number of redundant bytes in said Reed Solomon frame and said number of symbols comprised within said Reed Solomon frame.

7. The method of claim 1, wherein said data transmission delay rate is selected by a program utilized by said discrete multi-tone system.

8. The method of claim 1, wherein said data transmission delay rate is selected from at least one of 1, 2, 4, 8, 16 and 32 milliseconds.

9. The method of claim 1, wherein said number of redundant bytes in said Reed Solomon frame is selected from at least one of 2, 4, 6, 8, 10, 12, 14, and 16.

10. The method of claim 1, wherein values of said number of redundant bytes in a Reed Solomon frame and said number of symbols comprised by said Reed Solomon frame are

selected such that said number of redundant bytes in a Reed Solomon frame divided by said number of symbols comprised by said Reed Solomon frame is an integer.

11. The method of claim 10, wherein if the result of said division is not an integer, said number of symbols comprised by said Reed Solomon frame is decreased until said number of redundant bytes in a Reed Solomon frame divided by said number of symbols comprised by said Reed Solomon frame is an integer.

12. The method of claim 1, wherein said interleaver depth is equivalent to said data transmission delay rate multiplied by, four divided by said number of symbols comprised by said Reed Solomon frame.

13. A system for providing adaptive rate selection in a discrete multi-tone system, comprising:

a memory; and

a processor programmed by software stored within said memory to perform the steps of:

reading a specified data transmission delay rate for a channel utilized for data transmission;

reading a specified number of redundant bytes in a Reed Solomon frame;

determining a level of impulse protection control from said number of redundant bytes in said Reed Solomon frame and a maximum code word length;

determining a number of symbols comprised within said Reed Solomon frame; and

determining an interlever depth via use of said number of symbols comprised within said Reed Solomon frame and said specified data transmission delay rate for said channel.

14. The system of claim 13, wherein said processor is further programmed to determining a maximum and minimum number of symbols in said Reed Solomon frame, wherein said number of symbols contained in said Reed Solomon frame is between said maximum and minimum number.

15. The system of claim 14, wherein said maximum number of symbols in said Reed Solomon frame is the lower of the number 16 and, the data transmission delay divided by four.

16. The system of claim 14, wherein said minimum number of symbols in said Reed Solomon frame is the higher of ½, and said data transmission delay multiplied by the quotient of four divided by a maximum interleaver depth.

17. The system of claim 13, wherein said processor is further programmed to determine capacity of said channel utilized for data transmission, wherein said data rate determination is performed via use of said determined capacity of said channel.

18. The system of claim 13, wherein said processor is further programmed to determine a data rate of transmission via use of said number of redundant bytes in said Reed Solomon frame and said number of symbols comprised within said Reed Solomon frame.

19. The system of claim 13, wherein said data transmission delay rate is selected by a program utilized by said discrete multi-tone system.

20. The system of claim 13, wherein said number of redundant bytes in said Reed Solomon frame is selected from at least one of 2, 4, 6, 8, 10, 12, 14, and 16

21. The system of claim 13, wherein values of said number of redundant bytes in a Reed Solomon frame and said number of symbols comprised by said Reed Solomon frame are selected such that said number of redundant bytes in a Reed Solomon frame divided by said number of symbols comprised by said Reed Solomon frame is an integer.

22. The system of claim 21, wherein if the result of said division is not an integer, said number of symbols comprised by said Reed Solomon frame is decreased until said number of redundant bytes in a Reed Solomon frame divided by said number of symbols comprised by said Reed Solomon frame is an integer.

23. The system of claim 13, wherein said interleaver depth is equivalent to said data transmission delay rate multiplied by, four divided by said number of symbols comprised by said Reed Solomon frame.

24. A system for providing adaptive rate selection in a discrete multi-tone system, comprising:

a memory; and,

a processor programmed by software stored within said memory to perform the step of reading a specified data transmission delay rate for a channel utilized for data transmission;

a Reed Solomon encoder that performs the steps of:

reading a specified number of redundant bytes in a Reed Solomon frame;

determining a level of impulse protection control from said number of redundant bytes in said Reed Solomon frame and a maximum code word length; and

determining a number of symbols comprised within said Reed Solomon frame; and

an interlever for determining an interlever depth via use of said number of symbols comprised within said Reed Solomon frame and said specified data transmission delay rate for said channel.

25. The system of claim 24, wherein said Reed Solomon encoder further performs the step of: determining a maximum and minimum number of symbols in said Reed Solomon frame, wherein said number of symbols contained in said Reed Solomon frame is between said maximum and minimum number.

26. A system for providing adaptive rate selection in a discrete multi-tone system, comprising:

means for specifying a data transmission delay rate for a channel utilized for data transmission;

means for specifying a number of redundant bytes in a Reed Solomon frame;

means for determining a level of impulse protection control from said number of redundant bytes in said Reed Solomon frame and a maximum code word length;

means for determining a number of symbols comprised within said Reed Solomon frame; and

means for determining an interlever depth via use of said number of symbols comprised within said Reed Solomon frame and said specified data transmission delay rate for said channel.

27. The system of claim 26, further comprising means for determining a maximum and minimum number of symbols in said Reed Solomon frame, wherein said number of symbols contained in said Reed Solomon frame is between said maximum and minimum number.

28. The system of claim 27, wherein said maximum number of symbols in said Reed Solomon frame is the lower of the number 16 and, the data transmission delay divided by four.

29. The system of claim 27, wherein said minimum number of symbols in said Reed Solomon frame is the higher of ½, and said data transmission delay multiplied by the quotient of four divided by a maximum interleaver depth.

30. The system of claim 26, further comprising means for determining capacity of said channel utilized for data transmission, wherein said data rate determination is performed via use of said determined capacity of said channel.

31. The system of claim 26, further comprising means for determining a data rate of transmission via use of said number of redundant bytes in said Reed Solomon frame and said number of symbols comprised within said Reed Solomon frame.

32. The system of claim 26, wherein said data transmission delay rate is selected by a program utilized by said discrete multi-tone system.

33. The system of claim 26, wherein said data transmission delay rate is selected from at least one of 1, 2, 4, 8, 16 and 32 milliseconds.

34. The system of claim 26, wherein said number of redundant bytes in said Reed Solomon frame is selected from at least one of 2, 4, 6, 8, 10, 12, 14, and 16.

35. The system of claim 26, wherein values of said number of redundant bytes in a Reed Solomon frame and said number of symbols comprised by said Reed Solomon frame are selected such that said number of redundant bytes in a Reed Solomon frame divided by said number of symbols comprised by said Reed Solomon frame is an integer.

36. The system of claim 35, wherein if the result of said division is not an integer, said number of symbols comprised by said Reed Solomon frame is decreased until said number of redundant bytes in a Reed Solomon frame divided by said number of symbols comprised by said Reed Solomon frame is an integer.

37. The system of claim 26, wherein said interleaver depth is equivalent to said data transmission delay rate multiplied by, four divided by said number of symbols comprised by said Reed Solomon frame.

38. The system of claim 26, wherein, if capacity of said channel increases, said number of symbols comprised in said Reed Solomon frame changes value, resulting if a change in Reed Solomon overhead.